



# PERSONNEL QUALIFICATION STANDARD

FOR

H-1 HELICOPTER

QUALIFICATION SECTION 5

ELECTRICAL



## AVIATION PQS USER'S GUIDE

This guide will explain the Personnel Qualification Standard (PQS) what it is, and how to use it.

### . WHAT IS PQS

PQS is a part of your Command's overall training program. It provides minimum requirements to qualify on a Watchstation/Workstation. It is a tool for qualifying officer and enlisted personnel in certain assigned duties. PQS will assist you in becoming a more productive member of the "combat qualified Navy team."

### I. WHAT MAKES UP THE PQS PROGRAM

The PQS program consists of the Standard booklet, the Qualification Progress Chart.

A. The Standard booklet contains questions you must be able to answer. Performance items you must be able to do in order to qualify for a particular Watchstation/Workstation. Standards are written by naval personnel after themselves, "What do I need to know to do the job properly?"

The Standard booklet is made up of the following parts:

1. USER'S GUIDE
2. DEFINITIONS OF WORDS USED IN PQS
3. TABLE OF CONTENTS
4. FUNDAMENTALS (100 SERIES)
5. SYSTEMS (200 SERIES)
6. MAINTENANCE ACTIONS (300 SERIES)
7. FEEDBACK FORM (CHANGE REQUEST)

B. The Qualification Card is used as a record of accomplishment contained in the Standard booklet.

C. The Progress Chart is used to display all the Standards in progress that have been completed by your division or work center. Your division uses the progress chart to determine who is qualified to stand the watch and perform the tasks required by your division. You should check the progress chart periodically to make sure all of the Standards you have completed have been recorded.

### II. PQS FORMAT

B. Each Fundamental, System and Watchstation/Workstation is assigned a digit number.

Example: 5201

5 - Indicates qualification area (5 = Electrical)

201 - Indicates section 2 (System section) and that it is the

In the systems part of your Standard booklet, you may find a following example. For item .21 you must answer questions A, B, For item .22 only questions A and B are required. If there are no X's all questions must be answered.

#### 5201.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?

- .21 AC generator
- .22 Supervisory panel

| A | B | C |
|---|---|---|
| X | X | X |
| X | X |   |

#### C. Qualification Group Numbering System

The Watchstation/Workstation (400) section is divided into groups. Your book may be used for more than one final qualification Helicopter Electrical Technician. Each group is indicated on a Final Sign-Off Page as follows:

Example: NAVEDTRA 43431-5Q1

- 43431 - Indicates NAVEDTRA number assigned to the PQS
- 5 - Indicates Electrical
- Q1 - Indicates the first qualification group

1. FUNDAMENTALS (100 Series) This section identifies basic needed to do the job properly. Normally you would have acquired this

2. SYSTEMS (200 Series) In systems, the subject under discussion is broken down into functional sections that may be compared to the electrical system of your car. The components of the electrical system are scattered throughout the vehicle, but taken all together they form the "electrical system." The same is true for the equipment you are studying onboard. The components may not all be in one place, but they still form a system.

3. MAINTENANCE ACTIONS (300 Series) This section contains the procedures you need to know to properly perform your job.

4. QUALIFICATION SECTION (400 Series) The Maintenance Actions are divided into final qualification "groups" (Qual 1, Qual 2, etc.) with each group containing the following:

a. Final Qualification Sign-Off Page

Final record that is filed in your service jacket and recorded in your Service Record upon final qualification.

b. Qualification Summary Page

Record of completion of other PQS qualifications, and Maintenance Actions within a qualification group

c. Fundamentals and Systems Summary Page

Record of completion of Fundamentals and Systems required for all Maintenance Actions in a qualification group

d. Workstations (Maintenance Action Task Sign-Off Pages)

Record of completion of performed tasks required by each Maintenance Action

. HOW TO QUALIFY

Your division officer or work center supervisor will issue you a PQS. Your supervisor will assign Watchstations/Workstations and set time limits for completing your qualification. Progress toward qualification will be tracked on the division/work center Progress Chart.

1. Open your Standard booklet to your assigned Watchstation/Workstation.

3. As you complete a Fundamental or System section, have the Qualification Petty Officer sign your Fundamentals and Systems Summary page located in the particular qualification group. When you have completed the prerequisites, you will be ready to start the performance items listed for that Watchstation/Workstation. Report your completion of all requirements of that Watchstation/Workstation to your supervisor.

## V. THE SUPERVISOR

1. As a senior petty officer, you will be required to assign trainees to complete specific Watchstations/Workstations in PQS. When you do assignments, look through the Standard booklet to determine other items that should be done before work is started on the required Watchstations/Workstations of Fundamentals and Systems. If you are assigning more than one Watchstation or section to be completed, it is your decision to specify which one should be completed first. The supervisor is an extremely important part of the PQS process; it is to be successful. If you administer PQS with insight, you will find it is a helpful tool that can fit into your overall training plan. You are responsible for the accuracy, updating, and tailoring of PQS to fit your division's needs, as well as for the initiation of appropriate feedback to the PQS Debriefing (feedback forms are located in the back of each Standard booklet). You are responsible for providing motivation to your personnel by assigning goals, showing interest in the trainees' progress. The supervisor is responsible for training personnel to update and maintain the progress chart. It is important that the supervisor be aware of who is and who is not progressing, as well as where course correction or additional individual instruction may be needed. A sample PQS progress chart can be found in the Navy Handbook on Management and Implementation Procedures for Aviation Personnel (NAVMAN 43100-2). As a supervisor you must be totally familiar with the duties, responsibilities, and assignments of your Qualification Petty Officers. Your division will not survive without good planning and quality control.

## VI. THE QUALIFICATION PETTY OFFICER

1. Selection as a Qualification Petty Officer means that you are the command's subject matter experts on those Fundamentals, Systems and Workstations assigned to you. PQS cannot be successful without you being totally knowledgeable in your assigned areas, to make yourself available to check off your trainees' achievements, and to ensure that a high-quality standard is maintained in your division.

2. Each Qualification Petty Officer should have a set of star signatures for the Watchstations/Workstations so that all trainees receive the same signatures. If there are multiple signatures required for a line item, it is preferable that the signatures be spaced over a period of time, such as one day or one watch elapse between signatures. If the trainee does not know the correct answer, it is your responsibility to help find the answer in the Standard booklet.

## DEFINITIONS OF WORDS USED IN PQS

EW EVOLUTION - (AVIATION ONLY) A grouping of aircrew tasks that measure performance in the course of a flight

NENTS Major units that make up a system when properly connected

NENT PART - A major part of a component

OL SIGNAL - A signal used to control electronic or mechanical devices

ENCY - An event or series of events in progress that will cause damage to personnel unless immediate, timely and corrective steps are taken

IONAL LOCATION - The position of a component within a system - not necessarily physical location

MENTALS - Basic facts, theory, law or principles (100 Series in PQS)

LOCK - A protective device to prevent the unsafe operation of equipment or influence the action of systems, components, or component parts

ENANCE ACTION - (AVIATION ONLY) A maintenance technician qualification measures ability to perform a designated task

L OPERATING VALUE - The point at which satisfactory performance may be expected

ETER - A variable (temperature, pressure, flow rate, voltage, current, etc.) that must be indicated, monitored, checked, or sensed during operation

CTIVE FEATURE - A device designed to prevent damage or injury

NG POINT - The point in a system at which a signal may be detected

INT - The value of a parameter at which: (a) an alarm is set off, (b) an adjustment is required, (c) valves open or shut, (d) proper operation stops and starts, or (e) the optimum value for normal operation

MS - Groups of components that operate together to perform specific functions (100 Series in PQS)

M INTERRELATION (a) Significant effects from external influences affecting the system under discussion. (b) Other equipment being affected by the system

The following personnel, under the supervision of the PQS Development Group, made a significant contribution to the development of this for H-1 Helicopter Electrical (Qual 5):

|                       |             |
|-----------------------|-------------|
| GYSGT J. PERSSON      | HML-167     |
| GYSGT G. M. FERRIS    | HML-267     |
| AE1 J. H. CAUDRON, JR | HC-16 FRAMP |

## FUNDAMENTALS

- 5101 Aircraft Maintenance
- 5102 Electrical
- 5103 Wiring Techniques and Electrical Troubleshooting
- 5104 Electronic Circuits Signal Tracing
- 5105 Electrical Components
- 5106 Aircraft Maintenance Safety
- 5107 General Aviation Safety
- 5108 Electrical Safety

## SYSTEMS

- 5201 AC Power
- 5202 DC Power
- 5203 External Power
- 5204 Battery
- 5205 Starter
- 5206 Fuel Quantity-Indicating
- 5207 Fuel Boost/Pressure
- 5208 Auxiliary Fuel
- 5209 Engine Oil Temperature-Indicating
- 5210 Engine Oil Pressure-Indicating
- 5211 Combining Gearbox Oil Temperature-Indicating
- 5212 Combining Gearbox Oil Pressure-Indicating
- 5213 Transmission Oil Temperature-Indicating
- 5214 Transmission Oil Pressure-Indicating
- 5215 Turbine Inlet Temperature-Indicating (ITT/TIT/T-5)
- 5216 Exhaust Gas Temperature-Indicating
- 5217 Torque Pressure-Indicating
- 5218 Air Particle Separator
- 5219 Idle Stop
- 5220 Governor Linear Actuator
- 5221 Hydraulic
- 5222 Tachometer Generator Indication
- 5223 Master Caution Lights and Caution Advisory
- 5224 Miscellaneous Caution and Warning
- 5225 Chip Detection
- 5226 RPM Warning
- 5227 Fire Detection and Warning
- 5228 Fire-Extinguishing
- 5229 Attitude-Indicating
- 5230 Ice Detection/Anti-Ice
- 5231 Gyromagnetic Compass
- 5232 Force Trim

SYSTEMS (CONT'D)

5242 Rain Removal  
5243 Windshield Wiper  
5244 Rescue Hoist Control  
5245 Cargo Hook  
5246 Canopy Door Actuating

MAINTENANCE ACTION

5301 H-1 Helicopter Electrical Technician

## References:

- a. Naval Aviation Maintenance Program (NAMP) (OPNAVI)
  - b. NAVAIR 01-1A-509
  - c. Airman (NAVEDTRA 10307)
  - d. Tools and Their Uses (NAVEDTRA 10085)
  - e. NAVAIR 16-1-540
- .1 State the definition or purpose of the following NAMP terms
- a. Three levels of NAMP
  - b. Work Center
  - c. Work Center Supervisor
  - d. Maintenance control
  - e. Material control
  - f. Julian date
  - g. Planned Maintenance System (PMS)
  - h. Scheduled maintenance
  - i. Unscheduled maintenance
  - j. Preventive maintenance
  - k. Turnaround inspection
  - l. Daily inspection
  - m. Special inspection
  - n. Conditional inspection
  - o. Phased maintenance inspection
  - p. Maintenance Requirement Cards (MRCs)
  - q. Maintenance Data Collection System (MDCS)
  - r. Man-hour accounting
  - s. Maintenance data reporting
  - t. Work Unit Code Manual
  - u. Support Action Form (SAF)
  - v. Visual Information Display System/Maintenance Act (VIDS/MAF)
  - w. Transfer inspection
  - x. Acceptance inspection
  - y. Engineering Investigation (EI), Quality Deficiency and Safety Reporting Programs
  - z. Register
  - aa. Tool control program
  - ab. SCIR

- .3 Identify and state the uses of the following handtools
- a. Open-end wrench
  - b. Box-end wrench
  - c. Combination wrench
  - d. Adjustable wrench
  - e. Allen wrench
  - f. Spanner wrench
  - g. Socket wrench set
  - h. Torque wrench
  - i. Common screwdriver
  - j. Phillips screwdriver
  - k. Reed and Prince screwdriver
  - l. Offset screwdriver
  - m. Combination pliers
  - n. Channel-lock pliers
  - o. Duckbill pliers
  - p. Diagonal cutting pliers (dykes)
  - q. Vise-grip pliers
  - r. Retaining ring pliers
  - s. Electrical pliers
  - t. Needle-nosed pliers
  - u. Voltmeter (Simpson 260)
  - v. Voltmeter (digital)
- .4 Identify and state the uses of the following hardware
- a. Bolts
  - b. Screws
  - c. Nuts
  - d. Washers
  - e. Cotter pins
  - f. Snap rings
  - g. Quick-release pins
  - h. Turnlock fasteners
  - i. Lockwire
  - j. Single-wire safety wire
  - k. Double-twist safety wire
  - l. Shear wire
- .5 Discuss the information contained in the Avionic Clear Prevention/Control Manual (NAVAIR 16-1-540).

02 ELECTRICAL FUNDAMENTALS

References:

- a. Basic Electricity (NAVEDTRA 10086)
- b. Basic Electronics (NAVEDTRA 10087)

.1 Define the following terms, stating the units of measurement, identifying letters, and characteristics of each:

- |               |                         |
|---------------|-------------------------|
| a. Current    | f. Inductive reactance  |
| b. Voltage    | g. Capacitance          |
| c. Resistance | h. Capacitive reactance |
| d. Power      | i. Impedance            |
| e. Inductance | j. Resonance            |

.2 State the characteristics of the following and identify the symbols for each:

- |                      |                |
|----------------------|----------------|
| a. Switch            | j. Rheostat    |
| b. Conductor         | k. Ammeter     |
| c. Battery           | l. Voltmeter   |
| d. Lamp              | m. Ohmmeter    |
| e. Fuse              | n. Ground      |
| f. Fixed resistor    | o. Transformer |
| g. Variable resistor | p. Inductor    |
| h. Tapped resistor   | q. Capacitor   |
| i. Potentiometer     |                |

.3 Explain Ohm's Law.

.4 Use resistance formulas and power formulas to solve for unknown values in the following circuits:

- a. Series
- b. Parallel
- c. Series-parallel

.5 Explain the effects of open and shorted components on DC circuits.

.6 Explain the use of a multimeter to measure values in a DC circuit.

.7 Determine voltage values and polarities in a series voltage-reference network.

- .13 Use Ohm's Law, reactance formulas and/or trigonometric for values in series and parallel RLC circuits.
- .14 Describe the use of inductors and capacitors in filter
- .15 Explain the use of a vacuum-tube voltmeter (VTVM), sign and oscilloscope to analyze AC circuits.

## References:

- a. NAVAIR 01-1A-505
- b. Basic Electricity (NAVEDTRA 10086)
- c. Basic Electronics (NAVEDTRA 10087)
- d. Aviation Electrician's Mate 3 & 2 (NAVEDTRA 10348)

.1 Describe how to replace/repair aircraft connectors, coaxial and wiring using the following tools/hardware:

- a. Wire strippers
- b. Crimping tool
- c. Terminals
- d. Splices
- e. Hot-air gun (shrink tubing)
- f. Tying
- g. Single-cord lacing
- h. Double-cord lacing
- i. Soldering iron and solder
- j. Potting compound
- k. Crimp-type connector (pins) contacts

.2 Identify the symbols for the following and state the basis of each:

- a. Circuit breaker
- b. Relay

.3 State the contents and use of the following:

- a. Schematic
- b. Wiring diagram
- c. Block diagram
- d. Isometric diagram
- e. Maintenance Instruction Manuals (MIMS)
- f. Illustrated Parts Breakdown (IPB) Manual

.4 State the steps used in basic electrical troubleshooting.

.5 Using simple circuits containing the following malfunctioning components, analyze the normal operation of the circuit, normal voltage, current and resistance values, and the

## Reference:

- a. Basic Electronics (NAVEDTRA 10087)
- .1 Given the applied voltages, determine if the following devices are forward-biased or reverse-biased:
  - a. Diode
  - b. Zener diode
  - c. PNP transistor
  - d. NPN transistor
- .2 Describe the signal flow of basic electronic circuits output in terms of phase relationship and magnitude of:
  - a. DC power supply and filter network
  - b. Common-emitter amplifier
  - c. Common-base amplifier
  - d. Common-collector amplifier
  - e. Push-pull power amplifier
  - f. Resistance-capacitance-coupled amplifier
  - g. Direct-coupled amplifier
  - h. Transformer-coupled amplifier

## ELECTRICAL COMPONENTS FUNDAMENTALS

### References:

- a. Aviation Electrician's Mate 3 & 2 (NAVEDTRA 10348)
- b. Basic Electricity (NAVEDTRA 10086)

.1 Define the following terms:

- a. Electromagnetic induction
- b. Commutation
- c. Geographic pole
- d. Magnetic pole
- e. Variation
- f. Deviation
- g. Compass swing
- h. Coefficient "C"
- i. Coefficient "B"
- j. Coefficient "A"
- k. Thermocouple
- l. Tachometer
- m. Wye : Delta connection
- n. Supervisory system
- o. Digital computer
- p. Analog computer
- q. Gyroscopic rigidity
- r. Gyroscopic precession
- s. Apparent precession
- t. Inclinometer
- u. Pitot pressure
- v. Static pressure
- w. Gravity
- x. Generator brush
- y. Generator slip rings
- z. Generator field
- aa. Generator armature

.2 State the basic components of the following:

- a. Synchro system
- b. Hydraulic system
- c. Three-phase brush-type generator
- d. Three-phase brushless generator
- e. Normal AC power supply system
- f. Emergency AC power supply system
- g. Gyro

.3 State how torque is produced in a synchro.

.4 Describe how output voltage is controlled in a three-phase AC generator.

.5 Discuss how the direction of rotation of an AC motor is reversed.

.6 List three basic flight instruments that can be tested with a vacuum-pressure test set.

## References:

- a. Local Command Safety Instructions
- b. Safety Precautions for Shore Activities (NAVMA)
- c. Local Command Instructions and Notices

- .1 List the authoritative manuals or instructions used.
- .2 Discuss the safety precautions applicable to the following areas:
  - a. Radiation danger area
  - b. Noise hazard areas
  - c. Landing gear areas
  - d. NO SMOKING areas
  - e. Propeller arc
  - f. Compressor and turbine plane of rotation
  - g. Exhaust areas
  - h. Ordnance stowage areas
- .3 Discuss the safety precautions applicable to the following conditions:
  - a. Aircraft grounding
  - b. Use of maintenance stands/ladders
  - c. Aircraft towing
  - d. Applying power to aircraft
  - e. Aircraft on jacks
  - f. Parking of ground support equipment (GSE) around aircraft
  - g. Tagging and resetting circuit breakers
  - h. Ramp speed limits
  - i. Foreign object damage (FOD) control
  - j. Tool control
  - k. Open fuel cell
  - l. Wearing of personal protective equipment
  - m. Foul weather conditions
  - n. Handling and stowage of flammable liquids
  - o. Handling of compressed gases
  - p. Fuel, oil, and hydraulic leaks

- .5 Explain the protective functions of the following:
  - a. External canopy jettison handle
  - b. External doors/gates for workstands
  - c. Sound attenuators
- .6 Describe the possible hazards to aircraft and/or personnel following are encountered/expected:
  - a. Overinflation (enclosed containers)
  - b. Underinflation (enclosed containers)
  - c. Gravity fueling
  - d. Pressure fueling
  - e. Wet start
  - f. Aircraft turnup
  - g. Fuel contamination
  - h. Storm Conditions I, II and III
- .7 State the reasons for not wearing rings or metallic watchbands working around aircraft.
- .8 State the location of emergency exits for your aircraft.

## References:

- a. Standard First-Aid Training Course (NAVEDTRA 1008)
- b. Local Command Safety Instructions ..
- c. Safety Precautions for Shore Activities (NAVMAT 1)
- d. Accident Prevention Manual (OPNAVINST 5101.2)
- e. NAVAIR 00-80R-14
- f. Basic Military Requirements (NAVEDTRA 10054)

- .1 State the major reasons for the following:
  - a. Shipboard casualty drills
  - b. Man overboard drills
  - c. Flight deck firefighting drills
  - d. Tool accountability
- .2 Discuss the most vital features of the following:
  - a. Pocket dosimeter
  - b. Protective mask
  - c. Flame-retardant flight gear
  - d. Safety goggles
  - e. Sound attenuators
  - f. Flight deck helmets
  - g. Flight deck vests
  - h. Oxygen breathing apparatus
- .3 Describe the following classes of fire, the characteristics of each, and state their primary and secondary extinguishing agents.
  - a. Class A
  - b. Class B
  - c. Class C
  - d. Class D
- .4 State the procedures for reporting a fire (aircraft)
- .5 Describe the standard hand signal for fire.

## References:

- a. Standard First-Aid Training Course (NAVEDTRA 10081)
- b. Basic Electricity (NAVEDTRA 10086)
- c. Local Command Safety Instructions
- d. Safety Precautions for Shore Activities (NAVMAT P-5100)

- .1 Explain what to do in case of electrical shock.
- .2 Explain how and why "Do Not Apply Electrical Power" signs are used.
- .3 Explain the procedure for resetting circuit breakers.
- .4 Define the following terms:
  - a. Body resistance
  - b. Energized circuits
  - c. Electrical fire
  - d. Electrical load
- .5 Describe the following as applied to body resistance:
  - a. Various levels of potential on current flow through the body
  - b. Environmental conditions
- .6 Describe the basic types of electrical cleaning agents.
- .7 Discuss the following as each applies to shop safety:
  - a. Shorting bar
  - b. High-voltage sign
  - c. Circuit secured sign
  - d. Tool condition
  - e. Stretcher
  - f. CO<sub>2</sub>
  - g. Cleanliness
  - h. Orderliness
  - i. Ventilation
  - j. Lighting
  - k. Rubber matting

AC POWER SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5201.1 What is the function of the AC power system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMR.

SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

|                              | A | B | C | D |
|------------------------------|---|---|---|---|
| .21 AC generator             | X | X | X | X |
| .22 Supervisory panel        | X | X |   |   |
| .23 Voltage regulator        | X | X |   |   |
| .24 Inverters                | X | X | X | X |
| .25 Relays                   | X | X |   |   |
| .26 AC voltmeter             | X | X | X | X |
| .27 AC failure caution light | X | X |   | X |

THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of AC power from

a. The generator to the main AC bus.

**5201.5 SYSTEM INTERRELATIONS**

- .51 How do the following external influences affect the system?
- a. Component malfunction of transmission or gearshift assembly
  - b. Failure of DC power source
- .52 How does this system affect the operation of the following systems?
- a. Instrumentation
  - b. Communication/Navigation Systems

**5201.6 SAFETY**

- .61 What general safety precautions (as described in MEL) apply to this system?

## DC POWER SYSTEM

5

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

- .1 What is the function of the DC power system?  
.11 Refer to a standard print of this system or to the actual equipment.  
.12 Refer to notes, cautions and warnings as stated in MIMS and MRC.

.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

|                                 | A | B | C | D | E |
|---------------------------------|---|---|---|---|---|
| .21 DC generator                | X | X | X | X | X |
| .22 Voltage regulator           |   | X | X |   | X |
| .23 Relays                      |   |   | X | X |   |
| .24 Voltmeter                   |   |   | X | X | X |
| .25 Ammeter/loadmeter           |   |   | X | X | X |
| .26 DC generator caution lights |   |   | X | X | X |

.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)  
.32 Using a diagram of the system, show the path of DC power from the generator to:

5202.5 SYSTEM INTERRELATIONS

- .51 There are no external influences on this system
- .52 How does this system affect the operation of the
  - a. DC instruments
  - b. AC power
  - c. Starter/generator

5202.6 SAFETY

- .61 What general safety precautions (as described in
- apply to this system?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

## 5203.1 What is the function of the external power system?

- .11 Refer to a standard print of this system or to the actual
- .12 Refer to notes, cautions and warnings as stated in MIMS an

5203.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What protection is provided by it?
- F. What are the probable indications if this component fa

|  | A    B |
|--|--------|
| .21 DC external power receptacle                   | X    X |
| .22 AC external power receptacle                   | X    X |
| .23 External power diode                           | X    X |
| .24 External power supply relay                    | X    X |
| .25 Nonessential bus relay                         | X    X |
| .26 External power voltage protection unit (AH-1T) | X    X |
| .27 Armament external power relay                  | X    X |
| .28 Armament control relay                         | X    X |
| .29 Nonessential bus switch                        | X    X |

5203.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of:

5203.5 SYSTEM INTERRELATIONS

- .51 How does fluctuating external power affect this
- .52 There are no effects on other equipment to be di

5203.6 SAFETY

- .61 What general safety precautions (as described in
- apply to this system?

BATTERY SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

## 4.1 What is the function of the battery system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MRC.

4.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Battery
- .22 Battery relay
- .23 Battery switch
- .24 Emergency power OFF switch (AH-1J/T)
- .25 Nonessential bus relay

|     | A | B | C | D | E |
|-----|---|---|---|---|---|
| .21 | X | X |   |   | X |
| .22 | X | X | X | X | X |
| .23 | X | X | X | X | X |
| .24 | X | X | X | X | X |
| .25 | X | X | X | X | X |

4.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of DC power from the battery to the relays.

4.4 OPERATING LIMITS

For the items listed answer the following questions:

5204.6 SAFETY

- .61 What general safety precautions (as described in  
apply to this system?
- .62 What special or unique safety precautions apply  
spill?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

.1 What is the function of the starter system?

.11 Refer to a standard print of this system or to the actual equipment.

.12 Refer to notes, cautions and warnings as stated in MIMS and MRC's

.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

|     | A                           | B | C | D | E | F |
|-----|-----------------------------|---|---|---|---|---|
| .21 | Battery                     | X | X |   |   | X |
| .22 | External power supply       | X | X | X | X | X |
| .23 | Starter/generator           | X | X | X | X | X |
| .24 | Starter relay               | X | X | X | X | X |
| .25 | Reverse-current relay (RCR) | X | X | X | X | X |
| .26 | Starter switch              | X | X | X | X |   |
| .27 | Circuit breakers            | X | X | X | X | X |

.3 THEORY OF OPERATION

.31 How does the system work? (Refer to MIMS)

.32 Using a diagram of the system, show the path of DC power from:

- a. The battery to the starter.
- b. The external power supply to the starter.

5205.5 SYSTEM INTERRELATIONS

A. None to be discussed.

5205.6 SAFETY

.61 What general safety precautions (as described in MI  
apply to this system?

FUEL QUANTITY-INDICATING SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

6.1 What is the function of the fuel quantity-indicating system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MRE.

SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component fails?

- .21 Fuel quantity indicator
- .22 Fuel quantity tank units/probe
- .23 Fuel quantity test set
- .24 Fuel level switch
- .25 Low fuel segment light
- .26 Fuel quantity press-to-test switch

|  | A | B | C | D | E |
|--|---|---|---|---|---|
| .21 Fuel quantity indicator            | X | X | X | X | X |
| .22 Fuel quantity tank units/probe     | X | X | X |   |   |
| .23 Fuel quantity test set             |   |   | X |   | X |
| .24 Fuel level switch                  | X | X | X | X | X |
| .25 Low fuel segment light             | X | X | X | X | X |
| .26 Fuel quantity press-to-test switch | X | X |   |   |   |

THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from:
  - a. The tank unit to the indicator.
  - b. The fuel level switch to the segment light.

OPERATING LIMITS

5207

## FUEL BOOST/PRESSURE SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5207.1 What is the function of the fuel boost/pressure system?

- .11 Refer to a standard print of this system or to the actu
- .12 Refer to notes, cautions and warnings as stated in MIMS

5207.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component

- .21 Boost pumps
- .22 Fuel flow switch
- .23 Fuel flow transmitter
- .24 Fuel flow indicator
- .25 Fuel pressure transmitter
- .26 Fuel pressure indicator
- .27 Fuel pressure switch
- .28 Boost pump switch
- .29 Boost pump caution light

A  
X  
X  
X  
X  
X  
X  
X  
X

5207.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power f

5207.5 SYSTEM INTERRELATIONS

- .51 There are no external influences on this system to be discussed.
- .52 How does this system affect the operation of the following:
  - a. Fuel Quantity System
  - b. Engine

5207.6 SAFETY

- .61 What general safety precautions (as described in MIMS, MRC's) apply to this system?
- .62 What special or unique safety precautions apply to the following:
  - a. Fuel spills
  - b. Fire

5208

## AUXILIARY FUEL SYSTEM

Reference:

- a. NAVAIR 01-110HCE-2

5208.1 What is the function of the auxiliary fuel system?

- .11 Refer to a standard print of this system or to the actual system.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5208.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
  - B. Where is it located?
  - C. What is the source of power?
  - D. What are the modes of operation or control?
  - E. What is the protective device?
  - F. What protection is provided by it?
  - G. What are the probable indications if this component fails?
- .21 Boost pump
  - .22 Auxiliary fuel switch
  - .23 Low-level float switch
  - .24 High-level float switch
  - .25 Low-level warning light

5208.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 If the system is malfunctioning, what indications will there be?

5208.4 OPERATING LIMITS

For the items listed answer the following questions:

- A. What are the normal operating values and tolerances?
  - B. Where are the operating limits sensed or monitored?
- .41 Voltage

ENGINE OIL TEMPERATURE-INDICATING SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

209.1 What is the function of the engine oil temperature-indicating system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MPP.

209.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Temperature bulb
- .22 Temperature switch
- .23 Temperature indicator

| A | B | C | D |
|---|---|---|---|
| X | X | X |   |
| X | X | X | X |
| X | X | X |   |

209.3 THEORY OF OPERATION

- .31 Using a diagram of the system, show the path of power from the temperature bulb to the indicator.

209.4 OPERATING LIMITS

- A. None to be discussed.

209.5 SYSTEM INTERRELATIONS

5210

## ENGINE OIL PRESSURE-INDICATING SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

5210.1 What is the function of the engine oil pressure-indicating system?

- .11 Refer to a standard print of this system or to the applicable manual.
- .12 Refer to notes, cautions and warnings as stated in Manual.

5210.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Pressure switch
- .22 Pressure transmitter
- .23 Pressure indicator
- .24 Pressure caution light

5210.3 THEORY OF OPERATION

- .31 Using a diagram of the system, show the path of power flow:
  - a. The pressure transmitter to the indicator.
  - b. The pressure switch to the caution light.

5210.4 OPERATING LIMITS

5210.6 SAFETY

- .61 What general safety precautions (as described in MIMS, MRC  
apply to this system?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

5211.1 What is the function of the combining gearbox oil temperature indicating system?

- .11 Refer to a standard print of this system or to the actual system.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5211.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Temperature bulb
- .22 Temperature switch
- .23 Temperature indicator
- .24 Temperature caution light

A  
X  
X  
X  
X

5211.3 THEORY OF OPERATION

- .31 Using a diagram of the system, show the path of power flow.
  - a. The oil temperature switch to the caution light.
  - b. The oil temperature bulb to the indicator.

5211.4 OPERATING LIMITS

COMBINING GEARBOX OIL PRESSURE-INDICATING SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

12.1 What is the function of the combining gearbox oil pressure-indicating system?

- .11 Refer to a standard print of this system or to the actual equipment.  
.12 Refer to notes, cautions and warnings as stated in MIMS and MRC.

12.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

.21 Pressure transmitter

| A | B | C | D | E |
|---|---|---|---|---|
| X | X | X |   |   |

.22 Pressure switch

|   |   |   |   |   |
|---|---|---|---|---|
| X | X | X | X | X |
|---|---|---|---|---|

.23 Pressure caution light

|   |   |   |   |   |
|---|---|---|---|---|
| X | X | X | X | X |
|---|---|---|---|---|

.24 Pressure indicator

|   |   |   |  |  |
|---|---|---|--|--|
| X | X | X |  |  |
|---|---|---|--|--|

12.3 THEORY OF OPERATION

.31 Using a diagram of the system, show the path of power from:

- a. The transmitter to the indicator.
- b. The pressure switch to the caution light.

12.4 OPERATING LIMITS

References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

5213.1 What is the function of the transmission oil temperature indicating system?

- .11 Refer to a standard print of this system or to the act
- .12 Refer to notes, cautions and warnings as stated in MIM

5213.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component part fails?

- .21 Temperature indicator
- .22 Temperature bulb
- .23 Temperature switch
- .24 Hot light

5213.3 THEORY OF OPERATION

- .31 Using a diagram of the system, show the path of power
  - a. The temperature bulb to the temperature indicator.
  - b. The oil hot light to the oil temperature switch.

5213.4 OPERATING LIMITS

- A. None to be discussed.

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

5214.1 What is the function of the transmission oil pressure-indicating system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMD.

5214.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Pressure transmitter
- .22 Pressure indicator
- .23 Pressure caution light
- .24 Pressure switch

|                            | A | B | C |
|----------------------------|---|---|---|
| .21 Pressure transmitter   | X | X | X |
| .22 Pressure indicator     | X | X | X |
| .23 Pressure caution light | X | X | X |
| .24 Pressure switch        | X | X | X |

5214.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from:
  - a. The transmitter to the indicator.
  - b. The pressure switch to the caution light.

5214.4 OPERATING LIMITS

**References:**

- a. NAVAIR 01-110HCB-2
- b. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2-10
- d. NAVAIR 01-H1AAB-2-10

5215.1 What is the function of the turbine inlet temperature indicating (ITT/TIT/T-5) system?

- .11 Refer to a standard print of this system or to the ac
- .12 Refer to notes, cautions and warnings as stated in M

5215.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 T-5 limiter
- .22 Thermocouple harness
- .23 Engine temperature indicator
- .24 Thermocoupler

5215.3 THEORY OF OPERATION

- .31 Using a diagram of the system, show the path of power flow:
  - a. The thermocouple harness to the T-5 limiter.
  - b. The T-5 limiter to the indicator.

5215.4 OPERATING LIMITS

- A. None to be discussed.

## EXHAUST GAS TEMPERATURE-INDICATING SYSTEM

Reference:

- a. NAVAIR 01-110HCA-2

.1 What is the function of the exhaust gas temperature-indicating system?

.11 Refer to a standard print of this system or to the actual equipment.  
.12 Refer to notes, cautions and warnings as stated in MIMS and MRC.

### SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

|                          | A | B | C | D | E |
|--------------------------|---|---|---|---|---|
| .21 Resistor spool       | X | X | X |   |   |
| .22 Temperature gauge    | X | X | X | X | X |
| .23 Thermocouple harness | X | X | X |   |   |
| .24 JETCAL analyzer      | X |   |   |   |   |

### THEORY OF OPERATION

.31 Using a diagram of the system, show the path of power from the thermocouple harness to the indicator.

### OPERATING LIMITS

For the items listed answer the following questions:

- A. What are the normal operating values and tolerances?
- B. Where are the operating limits sensed or monitored?

.41 Resistance of harness

## References:

- a. NAVAIR 01-110HCB-2
- b. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2-10
- d. NAVAIR 01-H1AAB-2-10
- e. NAVAIR 01-110HCA-2

5217.1 What is the function of the torque pressure-indicating system?

- .11 Refer to a standard print of this system or to the MIMS.
- .12 Refer to notes, cautions and warnings as stated in the MIMS.

5217.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component part fails?

- .21 Torque pressure transmitters
- .22 Torque pressure indicators
- .23 Torque pressure test set

5217.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the torque pressure transmitter to the indicator.

5217.4 OPERATING LIMITS

- A. None to be discussed.

5217.5 SYSTEM INTERRELATIONS

AIR PARTICLE SEPARATOR SYSTEM

## References:

- a. NAVAIR 01-110HCB-2
- b. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2-11
- d. NAVAIR 01-H1AAB-2-11
- e. NAVAIR 01-110HCA-2

5218.1 What is the function of the air particle separator system?

- .11 Refer to a standard print of this system or to the actual
- .12 Refer to notes, cautions and warnings as stated in MIMS and

5218.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components  
component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- |                                      | A | B |
|--------------------------------------|---|---|
| .21 Air particle separator actuators | X | X |
| .22 Air particle separator relays    | X | X |
| .23 Engine emergency switches        | X | X |
| .24 Air particle separator OFF light | X | X |

5218.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from
  - a. The emergency switch to the actuator.
  - b. The air particle separator relay to the caution light.

5218.4 OPERATING LIMITS

5218.6 SAFETY

- .61 What general safety precautions (as described in MIM  
apply to this system?

## References:

- a. NAVAIR 01-110HCB-2
- b. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2-11
- d. NAVAIR 01-H1AAB-2-11
- e. NAVAIR 01-110HCA-2

1 What is the function of the idle stop system?

11 Refer to a standard print of this system or to the actual equipment  
12 Refer to notes, cautions and warnings as stated in MIMS and MRC's

2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

|    | A | B | C | D | E | F |
|----|---|---|---|---|---|---|
| 21 | X | X | X |   | X | X |
| 22 | X | X | X | X | X | X |
| 23 | X | X | X | X | X | X |

3 THEORY OF OPERATION

31 How does the system work? (Refer to MIMS)

32 Using a diagram of the system, show the path of power from the 28V DC essential bus to the solenoid.

33 If the system is malfunctioning, what indications will you receive?

4 OPERATING LIMITS

- A. None to be discussed.

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5220.1 What is the function of the governor linear actuator?

- .11 Refer to a standard print of this system or to the a
- .12 Refer to notes, cautions and warnings as stated in M

5220.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

.21 Actuator

.22 Engine No. 2 governor trim actuator switch (AH-1T)

.23 Increase/decrease switch (RPM)

5220.3 THEORY OF OPERATION

.31 How does the system work? (Refer to MIMS)

.32 Using a diagram of the system, show the path of power from the RPM switches to the actuators.

5220.4 OPERATING LIMITS

- A. None to be discussed.

5220.5 SYSTEM INTERRELATIONS

5221

## HYDRAULIC SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5221.1 What is the function of the hydraulic system?

- .11 Refer to a standard print of this system or to the actual system.
- .12 Refer to notes, cautions and warnings as stated in MIMS

5221.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component

- .21 Pressure switch
- .22 Pressure warning lights
- .23 Master switch
- .24 Control switch
- .25 Bypass solenoid valve
- .26 Filter switch
- .27 Temperature caution lights (AH-1T)
- .28 Temperature switches (AH-1T)

A  
X  
X  
X  
X  
X  
X  
X

5221.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the pressure switch to the caution light.

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-10
- e. NAVAIR 01-H1AAB-2-10

5222.1 What is the function of the tachometer generator indication

- .11 Refer to a standard print of this system or to the actual e
- .12 Refer to notes, cautions and warnings as stated in MIMS and

5222.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fail

- |                                 | A | B | C |
|---------------------------------|---|---|---|
| .21 Engine tachometer generator | X | X | X |
| .22 Rotor tachometer generator  | X | X | X |
| .23 Tachometer indicators       | X | X | X |

5222.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from tachometer generator to the indicator.

5222.4 OPERATING LIMITS

For the items listed answer the following questions:

- A. What are the normal operating values and tolerances?

5222.6

SAFETY

- .61 What general safety precautions (as described in MIMS, MRC's apply to this system?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5223.1 What is the function of the master caution lights and advisory system?

- .11 Refer to a standard print of this system or to the
- .12 Refer to notes, cautions and warnings as stated in

5223.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?

- .21 Caution/advisory panel
- .22 Master caution light
- .23 Caution light relay (AH-1T)

5223.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the 28V DC essential bus to the master caution lights.
- .33 If the system is malfunctioning, what indications will there be?

5223.4 OPERATING LIMITS

- A. None to be discussed.

5223.5 SYSTEM INTERRELATIONS

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2
- e. NAVAIR 01-H1AAB-2

5224.1 What is the function of the miscellaneous caution and warning system?

- .11 Refer to a standard print of this system or to the appropriate manual.
- .12 Refer to notes, cautions and warnings as stated in the appropriate manual.

5224.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?

- .21 Governor manual control caution light
- .22 Engine governor switch
- .23 Battery temperature (temp) caution light
- .24 Battery overtemp sensor
- .25 External power door open caution light
- .26 External power door limit switch
- .27 90-degree temp/pressure (press) caution light (AH-1T)
- .28 90-degree oil temp switch (AH-1T)
- .29 90-degree oil press switch (AH-1T)
- .210 42-degree temp/press caution light (AH-1T)
- .211 42-degree oil temp switch (AH-1T)
- .212 42-degree oil press switch (AH-1T)
- .213 Fuel filter caution light
- .214 Fuel filter press switch
- .215 Ammo door OPEN caution light
- .216 Ammo door switches

5224.4 OPERATING LIMITS

For the items listed answer the following questions.

- A. What are the normal operating values and tolerances?  
B. Where are the operating limits sensed or monitored?

- .41 Battery temp
- .42 90- and 42-degree oil temp
- .43 90- and 42-degree oil press
- .44 Rotor brake press
- .45 Fuel filter press

5224.5 SYSTEM INTERRELATIONS

- A. None to be discussed.

5224.6 SAFETY

- .61 What general safety precautions (as described in MIL-STD-883C) apply to this system?

CHIP DETECTION SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

25.1 What is the function of the chip detection system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MRMs.

SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Engine chip detectors
- .22 Transmission chip detector
- .23 42-degree gearbox chip detector
- .24 90-degree gearbox chip detector
- .25 Chip detector light panel (AH-1J/T)
- .26 Chip detector warning light capsule
- .27 Transmission chip detector/indicator (AH-1T)

|     | A | B | C | D | E |
|-----|---|---|---|---|---|
| .21 | X | X | X |   | X |
| .22 | X | X | X |   | X |
| .23 | X | X | X |   | X |
| .24 | X | X | X |   | X |
| .25 | X | X | X |   | X |
| .26 | X | X | X | X |   |
| .27 | X | X | X |   | X |

THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the chip detector to the warning light.

RPM WARNING SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2
- e. NAVAIR 01-H1AAB-2

5226.1 What is the function of the RPM warning system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMD.

5226.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 RPM control unit
- .22 Engine control panel
- .23 Caution lights
- .24 Air particle separator relay

5226.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from:
  - a. The RPM control unit to the ICS.
  - b. The RPM control unit to the particle separator.
  - c. The RPM control unit to the caution light.
  - d. The tachometer generator to the RPM control unit.

5226.5 SYSTEM INTERRELATIONS

- .51 There are no external influences on this system to be discussed.
- .52 How does this system affect the operation of the following:
  - a. Engine
  - b. Rotor

5226.6 SAFETY

- .61 What general safety precautions (as described in MIMS, MRC's, etc.) apply to this system?

5227

## FIRE DETECTION AND WARNING SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5227.1 What is the function of the fire detection and warning system?

- .11 Refer to a standard print of this system or to the applicable MIMS.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5227.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Fire detection elements
- .22 Fire warning amplifier/detection control unit
- .23 Fire warning test switch
- .24 Fire pull handles
- .25 Fire detection circuit breakers
- .26 Warning lights

5227.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the DC essential bus to:
  - a. The fire pull handles.

5227.6 SAFETY

.61 What general safety precautions (as described in MIMS, MRC) apply to this system?

## References:

- a. NAVAIR 01-110HCB-2
- b. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2-11
- d. NAVAIR 01-H1AAB-2-11

5228.1 What is the function of the fire-extinguishing system?

- .11 Refer to a standard print of this system or to the act
- .12 Refer to notes, cautions and warnings as stated in MIM

5228.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Fire bottle squibs
- .22 Fire-extinguishing switch
- .23 Fire warning pull handles
- .24 Fire-extinguishing relays
- .25 Fire detector amplifiers
- .26 Fire detector test switch

5228.3 THEORY OF OPERATION

- .31 Using a diagram of the system, show the path of power from the 28V DC essential bus to:
  - a. The main fire bottle squibs.
  - b. The reserve fire bottle squibs.

5228.6 SAFETY

- .61 What general safety precautions (as described in MIMS, MRC's apply to this system?

5229

## ATTITUDE-INDICATING SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2
- d. NAVAIR 01-H1AAB-2

5229.1 What is the function of the attitude-indicating system?

- .11 Refer to a standard print of this system or to the actual
- .12 Refer to notes, cautions and warnings as stated in MIMS and

5229.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components  
component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Roll and pitch gyro
- .22 Rate gyro
- .23 Attitude indicator
- .24 Phase adapter

|     | A | B |
|-----|---|---|
| .21 | X | X |
| .22 | X | X |
| .23 | X | X |
| .24 | X | X |

5229.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)

5229.4 OPERATING LIMITS

For the items listed answer the following questions:

- A. What are the normal operating values and tolerances?

5229.6

SAFETY

- .61 What general safety precautions (as described in MIMS, MRC's apply to this system?
- .62 What special or unique safety precautions apply to gyro hand

5230      ICE DETECTION/ANTI-ICE SYSTEM

References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCE-2
- c. NAVAIR 01-H1AAA-2
- d. NAVAIR 01-H1AAB-2

5230.1    What is the function of the ice detection/anti-ice system?

- .11 Refer to a standard print of this system or to the actual system.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5230.2    SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Ice interpreter
- .22 Ice detector
- .23 De-icing hot air valve
- .24 Engine icing light
- .25 Engine ice detect light
- .26 Ice detector light

A    B  
X    X  
X    X  
X    X  
X    X  
X    X  
X    X

5230.3    THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)

5230.4    OPERATING LIMITS

For the items listed answer the following questions:

5231 GYROMAGNETIC COMPASS SYSTEM

References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2

5231.1 What is the function of the gyromagnetic compass system?

- .11 Refer to a standard print of this system or to the actual
- .12 Refer to notes, cautions and warnings as stated in MIMS a

5231.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component f

|   | A | B |
|---|---|---|
| .21 Flux valve transmitter                    | X | X |
| .22 Compass amplifier                         | X | X |
| .23 Directional gyro                          | X | X |
| .24 Compass controller                        | X | X |
| .25 Bearing-distance-heading indicator (BDHI) | X | X |
| .26 Standby compass                           | X | X |
| .27 MC-2 compass calibrator                   | X |   |

5231.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from

5231.5 SYSTEM INTERRELATIONS

- .51 How do the following external influences affect this system?
- Magnetic influence above or below 70-degree latitude
  - Shipboard magnetic influences
- .52 How does this system affect the operation of the following systems?
- TACAN System
  - Automatic Flight Control System (AFCS)

5231.6 SAFETY

- .61 What general safety precautions (as described in MIL-STD-883C) apply to this system?

FORCE TRIM SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2

232.1 What is the function of the force trim system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMW.

SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Force trim control switch
- .22 Force trim switches (pilot/copilot)
- .23 Magnetic brakes
- .24 Rotary actuators

|   | A | B | C | D |
|---|---|---|---|---|
| .21 Force trim control switch           | X | X | X | X |
| .22 Force trim switches (pilot/copilot) | X | X | X | X |
| .23 Magnetic brakes                     | X | X | X |   |
| .24 Rotary actuators                    | X | X | X | X |

THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from:
  - a. The force trim control switch to the pilot/copilot force trim switches.
  - b. The pilot/copilot force trim switches to the magnetic brakes/rotary actuators.

5232.6

SAFETY

- .61 What general safety precautions (as described in MIMS, apply to this system?

**References:**

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2
- e. NAVAIR 01-H1AAB-2

What is the function of the SCAS?

- 1 Refer to a standard print of this system or to the actual equipment
- 2 Refer to notes, cautions and warnings as stated in MIMS and MRC's.

**SYSTEM COMPONENTS AND COMPONENT PARTS**

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component fails?

|    | A | B | C | D | E | F |
|----|---|---|---|---|---|---|
| 1  | X | X | X | X |   | X |
| 2  | X | X | X | X |   | X |
| 3  | X | X | X | X |   | X |
| 4  | X | X | X | X | X | X |
| 5  | X | X |   |   |   | X |
| 6  | X | X |   |   |   | X |
| 7  | X | X |   |   |   | X |
| 8  | X | X |   |   |   | X |
| 9  | X | X | X | X |   | X |
| 10 | X | X | X | X |   | X |

**THEORY OF OPERATION**

- 1 How does the system work? (Refer to MIMS)
- 2 Using a diagram of the system, show the path of signals from:

5233.6 SAFETY

- .61 What general safety precautions (as described in MI
- apply to this system?

5234

## AUTOMATIC FLIGHT CONTROL SYSTEM (AFCS)

### Reference:

- a. NAVAIR 01-110HCE-2

5234.1 What is the function of the AFCS?

.11 Refer to a standard print of this system or to the actual

5234.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component fa

.21 AFCS control panel

.22 AFCS annunciator panel

.23 Sensor amplifier unit

.24 3-axes rate sensor

.25 Control motion transducers

.26 SCAS solenoid valves

.27 Electrohydraulic servo actuators

.28 Synchronizer control unit

.29 Electromechanical parallel trim rotary actuator

.210 ALT-HDG trim UP/DN/L/R switch

.211 Trim REL ON/OFF switch

.212 CPLR ENGA/DSENGA switch

.213 ATTD trim FWD/AFT/L/R switch

.214 ATTD ON/OFF switch

.215 Trim REL switch

.216 AFCS REL switch

.217 Altitude controller

5234.3 THEORY OF OPERATION

.31 How does the system work? (Refer to MIMS)

.32 Using a diagram of the system, show the path of:

5234.5 SYSTEM INTERRELATIONS

- .51 How does wind affect this system?
- .52 How does this system affect the operation of the Static Control Augmentation System (SCAS)?

5234.6 SAFETY

- .61 What general safety precautions (as described in MIM) apply to this system?

EXTERIOR LIGHTING SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

235.1 What is the function of the exterior lighting system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MR.

235.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Anticollision light assembly
- .22 Position lights
- .23 Navigation lights
- .24 Taillights
- .25 Rotor blade tip lights
- .26 Formation lights
- .27 Searchlight
- .28 Landing lights
- .29 Lighting control panels
- .210 Lighting switches
- .211 Flasher
- .212 Fluid level lights

|      | A | B | C | D |
|------|---|---|---|---|
| .21  | X | X | X | X |
| .22  | X | X | X | X |
| .23  | X | X | X | X |
| .24  | X | X | X | X |
| .25  | X | X | X | X |
| .26  | X | X | X | X |
| .27  | X | X | X | X |
| .28  | X | X | X | X |
| .29  | X | X | X | X |
| .210 | X | X | X | X |
| .211 | X | X | X | X |
| .212 | X | X | X | X |

235.3 THEORY OF OPERATION

5235.6 SAFETY

- .61 What general safety precautions (as described in MIM) apply to this system?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2
- e. NAVAIR 01-H1AAB-2

5236.1 What is the function of the interior lighting system?

- .11 Refer to a standard print of this system or to the actual eq
- .12 Refer to notes, cautions and warnings as stated in MIMS and

5236.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fail

|                                 | A | B | C |
|---------------------------------|---|---|---|
| .21 Light control panel         | X | X | X |
| .22 Light switches              | X | X | X |
| .23 Instrument lighting section | X | X | X |
| .24 Dome lighting section       | X | X | X |
| .25 Caution lighting section    | X | X | X |
| .26 Warning lighting section    | X | X | X |
| .27 Panel lighting section      | X | X | X |
| .28 Secondary lighting section  | X | X | X |
| .29 Floodlighting section       | X | X | X |
| .210 Map lighting section       | X | X | X |
| .211 Circuit breaker            | X | X | X |
| .212 AC power transformer       | X | X | X |

5236.3 THEORY OF OPERATION

5236.5 SYSTEM INTERRELATIONS

- .51 There are no external influences on this system to be considered.
- .52 How does this system affect the operation of the following systems?
  - a. Master Caution Lights and Caution Advisory System
  - b. Miscellaneous Caution and Warning System

5236.6 SAFETY

- .61 What general safety precautions (as described in MIMS etc.) apply to this system?

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2
- e. NAVAIR 01-H1AAB-2-10

5237.1 What is the function of the turn and slip indicating system?

- .11 Refer to a standard print of this system or to the actual system.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5237.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component fails?

.21 Turn and slip indicator

5237.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the nonessential bus to the turn and slip indicator.

5237.4 OPERATING LIMITS

- A. None to be discussed.

5237.5 SYSTEM INTERRELATIONS

- A. None to be discussed.

5237.6 SAFETY

- .61 What general safety precautions (as described in MIMS, etc.) apply to this system?

5238

## OUTSIDE AIR TEMPERATURE (OAT) SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2-11

5238.1 What is the function of the OAT system?

- .11 Refer to a standard print of this system or to the actual system.
- .12 Refer to notes, cautions and warnings as stated in MIMS etc.

5238.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What are the probable indications if this component fails?

- .21 OAT indicator
- .22 Probe

5238.3 THEORY OF OPERATION

- A. None to be discussed.

5238.4 OPERATING LIMITS

- A. None to be discussed.

5238.5 SYSTEM INTERRELATIONS

- A. None to be discussed.

5238.6 SAFETY

- .61 What general safety precautions (as described in MIMS, MF etc.) apply to this system?

5239

## PITOT-STATIC SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2-11
- e. NAVAIR 01-H1AAB-2

5239.1 What is the function of the pitot-static system?

- .11 Refer to a standard print of this system or to the actual aircraft.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5239.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Pitot tube
- .22 Static port
- .23 Aircraft plumbing
- .24 Pitot drain plugs
- .25 Airspeed indicators
- .26 Barometric altimeters
- .27 Vertical velocity indicators
- .28 Pitot tube heater switch
- .29 Air data pressure tester

5239.3 THEORY OF OPERATION

- A. None to be discussed.

5239.4 OPERATING LIMITS

5239.6    SAFETY

.61 What general safety precautions (as described in MIMS,  
etc.) apply to this system?

- a. NAVAIR 01-H10NCB-2
- b. NAVAIR 01-H1AAA-2
- c. NAVAIR 01-H1AAB-2-11

5240.1 What is the function of the ECU system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMW.

5240.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- |                                       | A | B | C |
|---------------------------------------|---|---|---|
| .21 Ventilation blower                | X | X | X |
| .22 Vent blower overload sensor       | X | X | X |
| .23 Vent blower relay                 | X | X | X |
| .24 Vent blower auto relays           | X | X | X |
| .25 Control relays                    | X | X | X |
| .26 Overheat switch                   | X | X | X |
| .27 Particle separator control relays | X | X | X |
| .28 Bleed air solenoids               | X | X | X |
| .29 Solenoid                          | X | X | X |
| .210 Control panel                    | X | X | X |
| .211 Vent switch                      | X | X | X |
| .212 Fire pull handles                | X | X | X |

5240.3 THEORY OF OPERATION

- A. None to be discussed.

5240.4 OPERATING LIMITS

For the items listed answer the following questions:

- A. What are the normal operating values and tolerances?

5240.5 SYSTEM INTERRELATIONS

- .51 There are no external influences on this system to l
  - .52 How does this system affect the operation of the fo
- a. Engine
  - b. Rain Removal System

5240.6 SAFETY

- .61 What general safety precautions (as described in MIN etc.) apply to this system?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCB-2
- c. NAVAIR 01-110HCE-2
- d. NAVAIR 01-H1AAA-2
- e. NAVAIR 01-H1AAB-2-11

5241.1 What is the function of the heating/ventilating system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMR.

5241.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Bleed air valve
- .22 Heater valve
- .23 Overheat switch
- .24 Aft outlet valve
- .25 Door post outlet valve
- .26 Aft outlet switch
- .27 Aft outlet limit switch
- .28 Air particle separator switch
- .29 Heater switch
- .210 Overheat relay
- .211 Vent blower switch
- .212 Vent blower motor

|      | A | B | C |
|------|---|---|---|
| .21  | X | X | X |
| .22  | X | X | X |
| .23  | X | X | X |
| .24  | X | X | X |
| .25  | X | X | X |
| .26  | X | X | X |
| .27  | X | X | X |
| .28  | X | X | X |
| .29  | X | X | X |
| .210 | X | X | X |
| .211 | X | X | X |
| .212 | X | X | X |

5241.3 THEORY OF OPERATION

5241.6 SAFETY

- .61 What general safety precautions (as described in MIMS etc.) apply to this system?

- a. NAVAIR 01-110HCB-2
- b. NAVAIR 01-H1AAA-2
- c. NAVAIR 01-H1AAB-2

242.1 What is the function of the rain removal system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MRC's.

242.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Bleed air solenoid
- .22 Rain removal solenoid
- .23 Particle separator control relay
- .24 Rain removal switch
- .25 Fire handles

|     | A | B | C | D | E |
|-----|---|---|---|---|---|
| .21 | X | X | X | X | X |
| .22 | X | X | X | X | X |
| .23 | X | X | X |   | X |
| .24 | X | X | X | X | X |
| .25 | X | X | X | X | X |

242.3 THEORY OF OPERATION

- A. None to be discussed.

242.4 OPERATING LIMITS

- A. None to be discussed.

242.5 SYSTEM INTERRELATIONS

- A. None to be discussed.

242.6 SAFETY

- .61 What general safety precautions (as described in MIMS, MRC's,

5243

## WINDSHIELD WIPER SYSTEM

### References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCE-2

5243.1 What is the function of the windshield wiper system?

- .11 Refer to a standard print of this system or to the act
- .12 Refer to notes, cautions and warnings as stated in MIM

5243.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What are the probable indications if this component fails?

- .21 Windshield wiper motor
- .22 Windshield wiper control switches

5243.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)

5243.4 OPERATING LIMITS

- A. None to be discussed.

5243.5 SYSTEM INTERRELATIONS

- A. None to be discussed.

5243.6 SAFETY

- .61 What general safety precautions (as described in MIMS, etc.) apply to this system?

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCE-2

44.1 What is the function of the rescue hoist control system?

- .11 Refer to a standard print of this system or to the actual equipment
- .12 Refer to notes, cautions and warnings as stated in MIMS and MRC's

44.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

|                                  | A | B | C | D | E |
|----------------------------------|---|---|---|---|---|
| .21 Hoist control switch (pilot) | X | X | X | X | X |
| .22 Hoist control switch (crew)  | X | X | X | X | X |
| .23 Cable cut switch             | X | X | X | X | X |
| .24 Up limit switch              | X | X | X | X | X |
| .25 Down limit switch            | X | X | X | X | X |
| .26 Cable cutter                 | X | X | X | X | X |
| .27 Hoist power relay            | X | X | X | X | X |
| .28 Boom actuator                | X | X | X | X | X |
| .29 Winch assembly               | X | X | X | X | X |
| .210 Cable warning light         | X | X | X |   | X |
| .211 Traction motor sheave       | X | X | X |   | X |
| .212 Hoist control box           | X | X | X |   | X |

244.3 THEORY OF OPERATION

.31 How does the system work? (Refer to MIMS)

244.4 OPERATING LIMITS

5244.6

SAFETY

- .61 What general safety precautions (as described in MIMS,  
etc.) apply to this system?

CARGO HOOK SYSTEM

## References:

- a. NAVAIR 01-110HCA-2
- b. NAVAIR 01-110HCE-2

5245.1 What is the function of the cargo hook system?

- .11 Refer to a standard print of this system or to the actual equipment.
- .12 Refer to notes, cautions and warnings as stated in MIMS and MIMR.

5245.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following components and component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Release
- .22 Release relay
- .23 Release switch (copilot)
- .24 Release switch (pilot)
- .25 Release switch (crew)
- .26 Warning light
- .27 Arm release switch

|     | A | B | C |
|-----|---|---|---|
| .21 | X | X |   |
| .22 | X | X |   |
| .23 | X | X |   |
| .24 | X | X |   |
| .25 | X | X |   |
| .26 | X | X |   |
| .27 | X | X |   |

5245.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from hook release relay to the hook release.

5245.4 OPERATING LIMITS

- A. None to be discussed.

- a. NAVAIR 01-H1AAA-2
- b. NAVAIR 01-H1AAB-2

5246.1 What is the function of the canopy door actuating system?

- .11 Refer to a standard print of this system or to the actuator.
- .12 Refer to notes, cautions and warnings as stated in MIMS.

5246.2 SYSTEM COMPONENTS AND COMPONENT PARTS

Discuss the designated items for the following component parts:

- A. What is its function?
- B. Where is it located?
- C. What is the source of power?
- D. What are the modes of operation or control?
- E. What is the protective device?
- F. What protection is provided by it?
- G. What are the probable indications if this component fails?

- .21 Actuators
- .22 Door OPEN switches
- .23 Door CLOSE switches
- .24 Door control switches
- .25 Door latch actuator switches

5246.3 THEORY OF OPERATION

- .31 How does the system work? (Refer to MIMS)
- .32 Using a diagram of the system, show the path of power from the door actuator switch to the door actuator.

5246.4 OPERATING LIMITS

- A. None to be discussed.

5246.5 SYSTEM INTERRELATIONS

- A. None to be discussed.

5246.6 SAFETY

For the following scheduled maintenance: (Discuss and per IAW MIMS and MRC's)

- A. What are the steps of this task?
  - B. What assistance is required from other work centers?
  - C. What operating limits must be monitored?
  - D. What safety precautions must be observed?
  - E. What support equipment can be used?
  - F. Perform this task.

- .11 Daily inspection (INSP)
  - .12 7-day INSP
  - .13 56-day INSP
  - .14 Phase "A" INSP
  - .15 Phase "B" INSP
  - .16 Phase "C" INSP
  - .17 Phase "D" INSP
  - .18 Turnaround INSP
  - .19 Acceptance/transfer INSP

## 5301.2 UNSCHEDULED MAINTENANCE TASKS

For the following unscheduled maintenance: (Discuss and IAW MIMS)

- A. What are the steps of this task?
  - B. What safety precautions must be observed?
  - C. What assistance is required from other work centers?
  - D. What support equipment can be used?
  - E. Explain how this task affects aircraft availability other maintenance tasks.
  - F. What are the operating limits?
  - G. What are the system limitations?
  - H. Inspect for corrosion and treat as required.
  - I. Perform this task.

5301.2 UNSCHEDULED MAINTENANCE TASKS (CONT'D)

|  | A | B | C | D | E | F | G |
|--|---|---|---|---|---|---|---|
| .212 T/S starter system                        | X | X | X | X | X | X |   |
| .213 Fuel system circuit OPCHECK               | X | X |   | X | X |   |   |
| .214 Fuel quantity-indicating system OPCHECK   |   | X | X | X | X |   |   |
| .215 T/S fuel quantity-indicating system       | X | X |   | X | X |   |   |
| .216 Calibrate fuel quantity-indicating system | X | X | X | X | X | X |   |
| .217 Exterior lighting system OPCHECK          | X | X |   | X | X |   |   |
| .218 T/S exterior lighting system              | X | X |   | X | X |   |   |
| .219 R/R anticolision light assembly           | X | X |   | X | X |   |   |
| .220 Interior lighting system OPCHECK          | X | X |   | X | X |   |   |
| .221 T/S interior lighting system              | X | X |   | X | X |   |   |
| .222 Fire detection system OPCHECK             | X | X |   | X | X |   |   |
| .223 RPM warning system OPCHECK                | X | X | X | X | X | X |   |
| .224 T/S RPM warning system                    | X | X | X | X | X | X |   |
| .225 Calibrate RPM warning system              | X | X | X | X | X | X |   |
| .226 R/R RPM warning control unit              | X | X |   |   |   |   |   |
| .227 Master caution panel OPCHECK              | X | X |   | X | X |   |   |
| .228 R/R master caution panel                  | X | X |   |   | X |   |   |
| .229 Air particle separator system<br>OPCHECK  | X | X | X | X | X | X |   |
| .230 T/S air particle separator circuit        | X | X |   | X | X | X |   |
| .231 Idle stop system OPCHECK                  | X | X |   | X | X |   |   |
| .232 T/S torque pressure-indicating circuit    | X | X |   | X | X |   |   |
| .233 R/R torque pressure transmitters          | X | X |   |   | X |   |   |
| .234 Calibrate torque pressure transmitters    | X | X |   | X | X |   |   |
| .235 R/R torque pressure indicator             | X | X |   |   | X |   |   |
| .236 T/S attitude-indicating system            | X | X |   | X | X |   |   |
| .237 R/R attitude indicator                    | X | X |   |   | X |   |   |
| .238 R/R rate gyro/attitude gyro               | X | X |   |   |   |   |   |
| .239 T/S engine temperature-indicating systems | X | X | X | X | X | X |   |
| .240 R/R engine temperature limiter            | X | X | X |   | X |   |   |
| .241 Calibrate engine temperature system       | X | X | X | X | X | X |   |
| .242 T/S chip detector system                  | X | X |   |   | X |   |   |
| .243 R/R chip detector                         | X | X |   |   | X |   |   |
| .244 T/S hydraulic circuit                     | X | X | X | X | X | X |   |
| .245 R/R hydraulic pressure switch             | X | X |   |   | X |   |   |
| .246 R/R hydraulic filter clog indicator       | X | X |   |   | X |   |   |

|  | A | B | C | D | E | F | G | H | I |
|--|---|---|---|---|---|---|---|---|---|
| .259 R/R canopy door actuator (AH-1T)            | X | X | X |   |   | X | X | X | X |
| .260 Force trim system OPCHECK                   | X | X |   | X |   | X | X |   | X |
| .261 T/S force trim circuit                      | X | X |   | X |   | X | X | X | X |
| .262 SCAS OPCHECK                                | X | X | X | X | X | X |   |   | X |
| .263 T/S SCAS                                    | X | X | X | X | X | X | X | X | X |
| .264 R/R sensor amplifier                        | X | X |   |   | X |   |   | X | X |
| .265 AFCS OPCHECK (UH-1N)                        | X | X | X | X | X | X |   | X | X |
| .266 T/S AFCS circuit                            | X | X | X | X | X | X | X | X | X |
| .267 R/R synchronizer control unit               | X | X |   |   | X |   |   | X | X |
| .268 R/R electrical connector pins               | X | X |   |   | X |   |   | X | X |
| .269 Splice wiring                               | X | X |   |   | X |   |   | X | X |
| .270 Gyromagnetic compass system<br>OPCHECK      | X | X |   |   | X |   | X | X | X |
| .271 T/S gyromagnetic compass system             | X | X |   |   | X |   | X | X | X |
| .272 R/R compass transmitter (flux valve)        | X | X |   |   |   |   | X | X | X |
| .273 R/R directional gyro                        | X | X |   |   |   |   | X | X | X |
| .274 R/R amplifier                               | X | X |   |   |   |   |   | X | X |
| .275 Calibrate compass system (compass<br>swing) |   |   |   |   |   | X | X | X | X |

### 5301.3 INFREQUENT SCHEDULED MAINTENANCE TASKS

For the following infrequent scheduled maintenance: (Do not perform IAW MIMS and MRC's)

- A. What are the steps of this task?
- B. What assistance is required from other work centers?
- C. What operating limits must be monitored?
- D. What safety precautions must be observed?
- E. What support equipment can be used?
- F. Perform when practicable or simulate this task.

- .31 1000-hour INSP
- .32 Compass calibration

A  
X  
X

### 5301.4 INFREQUENT UNSCHEDULED MAINTENANCE TASKS

For the following infrequent unscheduled maintenance: (Do not perform IAW MIMS)

- A. What are the steps of this task?

5301.4 INFREQUENT UNSCHEDULED MAINTENANCE TASKS (CONT'D)

|      |   | A | B | C | D | E | F | G |
|------|---|---|---|---|---|---|---|---|
| .42  | R/R inverter                                  | X | X |   |   | X |   |   |
| .43  | R/R AC generators                             | X | X | X |   | X |   |   |
| .44  | R/R AC power system relays                    | X | X |   |   | X |   |   |
| .45  | R/R AC supervisory panel                      | X | X |   |   | X |   |   |
| .46  | R/R dual voltmeter                            | X | X |   |   | X |   |   |
| .47  | R/R 26V AC instrument transformer             | X | X |   |   | X |   |   |
| .48  | R/R DC generator                              | X | X |   |   | X |   |   |
| .49  | R/R DC power system relays                    | X | X |   |   | X |   |   |
| .410 | T/S battery system                            | X | X |   | X | X | X | X |
| .411 | R/R battery relay                             | X | X |   |   | X |   |   |
| .412 | R/R ammeter/loadmeter                         | X | X |   |   | X |   |   |
| .413 | T/S external power supply system              | X | X |   | X | X | X | X |
| .414 | R/R external power supply relay               | X | X |   |   | X |   |   |
| .415 | R/R external power diode                      | X | X |   |   | X |   |   |
| .416 | R/R starter system relays                     | X | X |   |   | X |   |   |
| .417 | R/R exciter unit                              | X | X | X |   | X |   |   |
| .418 | T/S fuel system circuit                       | X | X | X | X |   |   | X |
| .419 | R/R fuel quantity indicator                   | X | X |   |   | X |   |   |
| .420 | R/R fuel quantity tank unit                   | X | X | X |   | X | X |   |
| .421 | R/R fuel level switch                         | X | X | X |   | X | X |   |
| .422 | R/R searchlight assembly                      | X | X |   |   | X |   |   |
| .423 | T/S fire detection system                     | X | X |   | X | X |   |   |
| .424 | R/R fire detection element                    | X | X |   | X |   |   | X |
| .425 | R/R fire detection amplifier                  | X | X |   | X |   |   |   |
| .426 | Ice detection system OPCHECK                  | X | X |   |   | X |   | X |
| .427 | T/S ice detector circuit                      | X | X |   |   | X |   | X |
| .428 | R/R ice detector                              | X | X |   |   |   |   |   |
| .429 | T/S idle stop system                          | X | X |   | X | X |   | X |
| .430 | R/R idle stop solenoid                        | X | X |   | X |   |   |   |
| .431 | T/S engine oil pressure-indicating circuit    | X | X |   | X | X |   | X |
| .432 | R/R engine oil pressure transmitters          | X | X |   |   | X |   |   |
| .433 | T/S engine oil pressure warning circuit       | X | X |   | X | X | X | X |
| .434 | R/R engine oil pressure switch                | X | X |   |   | X |   |   |
| .435 | T/S engine oil temperature-indicating system  | X | X |   |   | X |   | X |
| .436 | R/R engine oil temperature bulb               | X | X |   |   | X |   |   |
| .437 | R/R engine oil temperature/pressure indicator | X | X |   |   | X |   | X |
| .438 | T/S lightning rod                             | X | X |   |   | X |   |   |

|      |   |                     |     |         |
|------|---|---------------------|-----|---------|
| .447 | R/R engine temperature indicator                    | X X                 | X   | X X X   |
| .448 | T/S transmission oil pressure-indicating circuit    | X X X X             | X X | X       |
| .449 | R/R transmission oil pressure transmitter           | X X                 | X   | X X     |
| .450 | R/R transmission oil pressure switch                | X X                 | X   | X X     |
| .451 | T/S transmission oil temperature-indicating circuit | X X                 |     | X X X   |
| .452 | R/R transmission oil temperature bulb               | X X                 | X   | X X     |
| .453 | R/R transmission oil temperature switch             | X X                 | X   | X X     |
| .454 | R/R dual indicator                                  | X X                 | X   | X X X   |
| .455 | T/S tachometer generator indication system          | X X X X X X X X X X |     |         |
| .456 | R/R tachometer generators                           | X X                 | X   | X X     |
| .457 | R/R tachometer indicators                           | X X                 | X   | X X X   |
| .458 | R/R mixing valve                                    | X X                 | X   | X X     |
| .459 | T/S cargo hook circuit                              | X X                 | X   | X X X X |
| .460 | T/S rescue hoist circuit                            | X X                 | X   | X X X X |
| .461 | T/S pitot-static system                             | X X                 | X   | X X X X |
| .462 | Calibrate pitot-static system                       | X X                 | X   | X X     |
| .463 | R/R magnetic brake                                  | X X                 | X   | X X     |
| .464 | R/R transducer                                      | X X                 | X   | X X     |
| .465 | R/R 3-axes rate gyro (UH-1N)                        | X X                 | X   | X X     |
| .466 | R/R rotary actuator (UH-1N)                         | X X                 | X   | X X     |
| .467 | Windshield wiper system OPCHECK                     | X X                 | X   | X       |
| .468 | Windshield wiper circuit                            | X X                 | X   | X X     |
| .469 | Windshield wiper motor                              | X X                 | X   | X X     |
| .470 | R/R vertical speed indicator                        | X X                 | X   | X X     |
| .471 | R/R 8-day clock                                     | X X                 | X   | X X     |
| .472 | R/R standby magnetic compass                        | X X                 | X   | X X     |
| .473 | Calibrate standby magnetic compass                  | X X X X X X X       |     | X       |
| .474 | R/R outside air temperature indicator               | X X                 |     | X X     |
| .475 | R/R compass controller                              | X X                 |     | X X     |

## 5301.5 EMERGENCIES

For the emergencies listed below:

- A. What indications and alarms would be received?
- B. What immediate action is required?

Personnel Qualification Standard  
Information Report and Suggestion Sheet  
PQS DEVGRU AUTOVON 957-5367

From \_\_\_\_\_ D

Activity \_\_\_\_\_

Mailing Address \_\_\_\_\_

AUTOVON #

Qual Standard Affected \_\_\_\_\_ NAVEDTRA #

Section Affected \_\_\_\_\_

Page # \_\_\_\_\_

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Remarks/Recommendations (Use additional sheets if necessary)

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